

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

1 to 50 (canceled)

51. (new) A method of producing a transgenic avian comprising:

providing a microinjection assembly comprising an optical microscope and a micropipette;

viewing the micropipette from an angle oblique to the surface of an embryo;

injecting nucleic acid into the avian embryo by the micropipette;

allowing the avian embryo to develop into a chick,

thereby producing a transgenic avian.

52. (new) The method of claim 51 wherein the microscope is a light microscope.

53. (new) The method of claim 51 wherein the embryo is placed in an incident light beam angled from an optical axis of the objective.

54. (new) The method of claim 51 wherein an oscillation is applied to the micropipette.

55. (new) The method of claim 51 wherein the microinjection assembly comprises a piezo-electric oscillator.

56. (new) The method of claim 51 wherein the nucleic acid is a vector.

57. (new) The method of claim 56 wherein the vector is a non-viral vector.

58. (new) The method of claim 51 wherein the nucleic acid is a plasmid.

59. (new) The method of claim 51 wherein the avian embryo is an embryo of a chicken.

60. (new) The method of claim 51 comprising delivering the embryo to a recipient avian female.

61. (new) The method of claim 60 wherein the delivering is to an infundibulum of the recipient avian female.

62. (new) The method of claim 51 wherein injecting nucleic acid into the avian embryo through the pipette comprises inserting the micropipette into the germinal disc.

63. (new) The method of claim 51 wherein inserting the micropipette into the germinal disc comprises penetrating a vitelline membrane.

64. (new) The method of claim 51 wherein the nucleic acid is delivered to a recipient cell in the avian embryo.

65. (new) A method of producing a transgenic avian comprising:

providing a microinjection assembly comprising an optical microscope and a micropipette;

viewing the micropipette from an angle less than 90 degrees from perpendicular to an embryo;

injecting nucleic acid into the avian embryo by the micropipette;

allowing the avian embryo to develop into a chick,

thereby producing a transgenic avian.

66. (new) The method of claim 65 wherein the embryo is placed in an incident light beam angled from an optical axis of the objective.

67. (new) The method of claim 65 wherein an oscillation is applied to the micropipette.

68. (new) The method of claim 65 wherein the nucleic acid is a vector.

69. (new) The method of claim 65 wherein the nucleic acid is a plasmid.

70. (new) The method of claim 65 wherein the avian embryo is an embryo of a chicken.

71. (new) The method of claim 65 comprising delivering the embryo to a recipient avian female.

72. (new) The method of claim 65 wherein injecting nucleic acid into the avian embryo through the pipette comprises inserting the micropipette into the germinal disc.

73. (new) The method of claim 65 wherein the nucleic acid is injected into a recipient cell in the avian embryo.

74. (new) A method of producing a transgenic avian comprising:

providing a microinjection assembly comprising an optical microscope and a micropipette;

viewing the micropipette from the side;

injecting nucleic acid into the avian embryo by the micropipette;

allowing the avian embryo to develop into a chick,

thereby producing a transgenic avian.

75. (new) The method of claim 74 wherein the embryo is placed in an incident light beam angled from an optical axis of the objective.

76. (new) The method of claim 74 wherein an oscillation is applied to the micropipette.

77. (new) The method of claim 74 wherein the nucleic acid is a vector.

78. (new) The method of claim 74 wherein the nucleic acid is a plasmid.

79. (new) The method of claim 74 wherein the avian embryo is an embryo of a chicken.

80. (new) The method of claim 74 comprising delivering the embryo to a recipient avian female.

81. (new) The method of claim 74 wherein injecting nucleic acid into the avian embryo through the pipette comprises inserting the micropipette into the germinal disc.

82. (new) The method of claim 74 wherein the nucleic acid is injected into a recipient cell in the avian embryo.